

A NEW SPECIES OF THE GENUS *ANOPHELES* FROM NORTHERN AUSTRALIA
(DIPTERA, CULICIDAE).

By D. J. LEE, B.Sc., Department of Zoology, University of Sydney.

(Nine Text-figures.)

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ANOPHELES (*ANOPHELES*) *POWELLI*, n. sp.

This new species from northern Australia is a small brown concolorous Anopheline, in appearance suggesting a *Culex*. In the Australasian Region it is only to be confused with *A. stigmaticus* Skuse and *A. aitkenii* James (and species closely related to the latter). From these it is most readily distinguished in the female by its long slender proboscis, from *A. stigmaticus* by its uniformly dark brown legs and from *A. aitkenii* by the narrow elongate outstanding scales on the wing veins. The bifid inner anterior clypeals of the larva immediately distinguish this stage from *A. stigmaticus*, and the simple, thickened, outer clypeals from *A. aitkenii*.

DESCRIPTION.

Female.

Head. The integument is dark brown with a greyish bloom; rather sparsely covered with exceedingly narrow, elongate, black, upright-forked scales. No recumbent scales are present nor are there any scales projecting forward between the eyes, only black bristles. The pedicel and basal two-thirds of the first flagellar segment of the antennae are light brown, the rest brown with brown clothing hairs and dark brown verticillate hairs. The first flagellar segment is noticeably longer than the second (ratio 5:3), the succeeding ones subequal but increasing in length gradually to the apex, the apical segment being twice the length of the second. The total length of the antennae is scarcely more than half that of the proboscis. The clypeus is brown to dark brown, bare and pruinulent. The palpi are as long as the proboscis, uniformly dark brown scaled. The proboscis is similarly adorned, noticeably elongate with yellowish labella. The neck is prominent.

Thorax. The integument is shiny, dark brown to reddish-brown; certain parts may appear yellowish, particularly the anterior lateral areas of the scutum, but these are not constant. There are no scales present on any part of the thorax. The scutum bears three longitudinal lines of dark brown or black bristles, the central one median, the lateral ones midway between the median line and the lateral margins. There are also a few irregular lateral bristles anteriorly, and a pronounced group just before and above the wing base. The scutellum is uniformly rounded, brown, sometimes yellowish, with a prominent fringe of dark brown border bristles; the postnotum is brown and bare. There are few bristles on the pleurae. The pronotal lobes carry eight or nine dark brown bristles, the propleuron one, and the pronotum is bare. There are no spiracular bristles. On the sternopleuron there are one or two bristles on the posterior margin near the upper margin of the meron, one upper sternopleural bristle and a reduced pre-alar group of no more than one bristle. The mesepimeron has three or four sub-alar bristles. The halteres are pale-stemmed with a dark scaled knob.

Legs. The coxae are somewhat lighter than the pleurae and carry bristles but no scales. The femora, tibiae and tarsi of all legs are uniformly dark brown scaled above and below.

Wings. (Fig. 2.) These are uniformly dark brown scaled, the scaling dense on C, R₁ and Cu. The outstanding scales, particularly on the distal half of the wing, are distinctly narrow and elongate. The wing fringe is uniformly brownish. The upper fork cell is longer and narrower than the lower, its base nearer the wing base. The upper cell is slightly longer than its stem (one-fifth) and the lower slightly shorter (one-sixth). There is no dark cloud on the wing membrane.

Abdomen. The abdomen is brown, shining, devoid of scales but covered with brown hairs.

Male.

The male resembles the female except that the palpi are as long as the proboscis exclusive of the labella and the ultimate and penultimate segments are expanded into a distinct club which carries numerous hairs as well as scales. The antennae are plumose, with dense brown verticillate hairs. The proximal flagellar segments are subequal, the distal two lengthened, the terminal one being twice as long as the basal flagellar segments, the subterminal four times as long.

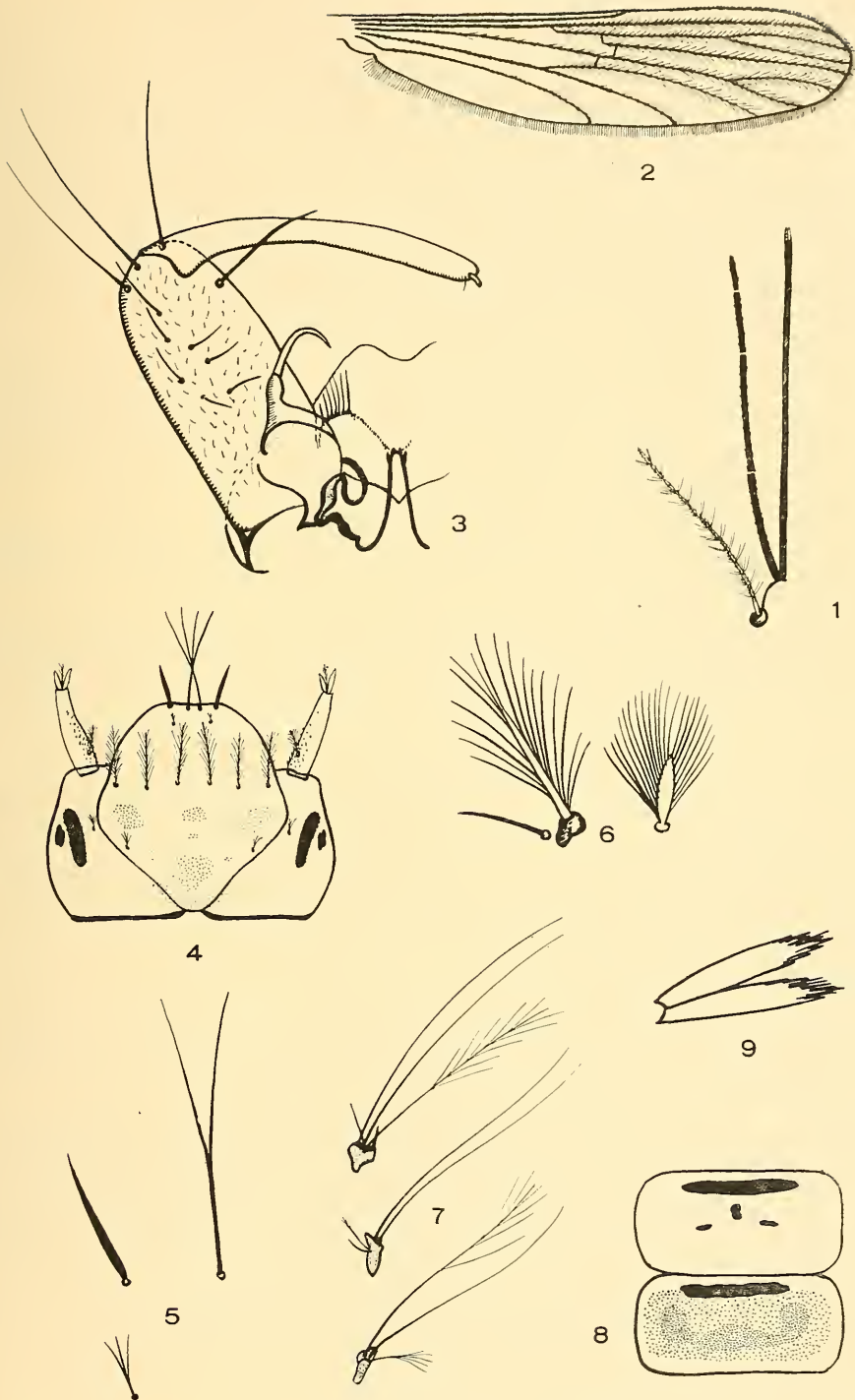
Genitalia. (Fig. 3.) The coxites are sparsely hairy and without scales. They are approximately cylindrical and about twice as long as broad. The claspers are narrow, very slightly expanded apically, about one-eighth longer than the coxites, bearing a terminal peg-like tooth and a few minute hairs. The coxite bears an internal subapical bristle which is slightly longer than the width of the coxite. A single stout curved spine in the position of the parabasal spines arises from a pronounced basal lobe which is prolonged into a distinct tubercle about one-third as long as the spine it bears. (This is similar to *A. stigmaticus* but considerably more strongly developed.) The harpagones are not noticeably separated into dorsal and ventral lobes, are finely hairy, and bear a continuous line of about nine short fine spines each arising from a small boss. The phallosome is smooth and terminates apically in a number of very short, inconspicuous spines.

Larva. (Figs. 4-9.)

The larva is small and pale, resembling in many respects those of both *A. stigmaticus* and *A. aitkenii*.

Head. The head is pale, often with darkened spots as illustrated in Fig. 4. The antennae are short, rather squat, spicular, particularly on the inner side, with a small seven- or eight-branched hair arising internally near the base. The inner anterior clypeals are long, crossed, usually bifid, though occasionally one is trifid; the branches arise at from one-third to one-half the length from the base. The outer anterior clypeals are simple, noticeably thickened and about half as long as the inners. The posterior clypeals are very fine, usually trifid (but vary from two- to four-branched), not reaching to the level of the bases of the outer clypeals. The frontal hairs are short and plumose, the innermost pair are longest, but even these scarcely reach the bases of the posterior clypeals. The inner suturals are trifid, the outer suturals usually four-branched and situated anterior to the inners. The ocular hair is five-branched.

Thorax. The inner shoulder hair (hair 1 of the prothorax) has about 30 branches arising from a thick, flattened shaft. The centre shoulder hair (hair 2) arises from a distinct boss, is plumose and with the shaft somewhat thickened; in length it is scarcely twice as long as hair 1. The outer shoulder hair is simple and slightly thickened. Hair 4 is about half as long again as 2, arising also from a distinct boss with thickened stem; it is sparsely plumose with prominent branches. Hair 5 is about as long as 4, plumose, but the branches are short and fine and its shaft is thickened. Hair 6 is long and simple and arises with 5 from the same strong boss. In all, the prothoracic group of hairs is considerably different from most other Anophelines. On the metathorax a reduced palmate tuft is present consisting of about 20 leaflets each of which is recognizably flattened. Of the pleural hairs, the pro-pleural group comprises three long hairs, two of which are simple and the third plumose. The meso-pleural group has two long simple hairs, and of the meta-pleural group one long hair is plumose.



Figs. 1-9.—*Anopheles (Anopheles) powelli*, n. sp. 1. Proboscis, palp and antenna of ♀, × 45. 2. Wing of ♀, × 25. 3. Male genitalia, × 225. 4. Head of larva, × 62. 5. Details of clypeal hairs, × 225. 6. Shoulder hairs, × 225. 7. Pleural hairs, × 65. 8. Details of chitinizations of abdominal segments VII and VIII, × 70. 9. Detail of leaflets of abdominal palmate tufts, × 500.

Abdomen. A palmate tuft similar to that of the metathoracic one is present on abdominal segment I and fully-developed palmate tufts occur on segments II-VII. The fan leaves are unusual in being strongly frayed before the apex. The chitinizations of the dorsal surface of the abdominal segments consist, on segments I to VII of an anterior, narrow-elliptical transverse plate, behind which is situated a very small laterally constricted longitudinal plate; behind this again are two very small round spots situated one on either side of the mid-line. On segment VIII the anterior plate is surrounded by a secondary chitinization almost entirely covering the dorsal part of the segment. The lateral hairs of the first three abdominal segments are noticeably long and strongly plumose. The pecten consists of approximately 14 teeth, the outer three or four at either end being considerably longer than the majority of the intervening ones. The saddle hair is long and divided apically into four or five branches.

Type locality: Adelaide River (Northern Territory of Australia), 1943 (O. W. Powell).

Types: Holotype male, allotype female and their associated larval skins together with a paratype series, also with their larval skins from the same locality and collection are located in the Museum of the Council for Scientific and Industrial Research, Canberra, A.C.T. Representative specimens from all recorded localities have also been lodged in the same Museum.

Distribution.—So far only recorded from northern Australia.

Queensland: Jacky Jacky, xi.42 (I. M. Mackerras). Northern Territory: Marara Swamp, near Darwin; Adelaide River, iii.43 (O. W. Powell); 8 miles S. of Adelaide River, ii.43, iii.43; Adelaide River, iii.43 (A. R. Woodhill); 10 miles N. of Pine Creek, iii.43 (Hegener); Groote Eylandt, ix.43 (J. Henry).

Biology. Powell and Woodhill found this species breeding in shallow overgrown swampy pools shaded by tall grass. Adults were taken in mosquito nets, some with blood in their abdomens, but it is unlikely that this species will be shown to have any importance as a vector of disease.

Comparative Notes.

In a series of 15 specimens of *A. powelli* from all recorded localities, the average ratio of proboscis to fore-tibia was 1.19, the range being from 1.12 to 1.28. A similar series of 15 specimens of *A. stigmaticus* from Sydney and Cairns gave an average ratio of 0.88 with a range of from 0.79 to 0.95. One specimen of *A. aitkenii* from Ceram gave a ratio of 0.83 for these structures. For the males the ratios were *A. powelli* 1.24 (range 1.20 to 1.27 in five specimens), *A. stigmaticus* 1.22 (range 1.15 to 1.27 in five specimens), and *A. aitkenii* 1.19 in one specimen. Hence it is only in the female that the proboscis character is of diagnostic value.

A similar relationship of the length of the proboscis to other structures is noticeable in *A. powelli* so that casual examination suggests that this structure is unusually long. The ratio of length of proboscis to length of antenna is 1.8 in *A. powelli* and 1.1 in *A. stigmaticus*.

The genitalia of the male, although with undoubted similarity to *A. stigmaticus*, are nevertheless distinct in the considerably reduced development of the claspette spines and the very short processes at the apex of the phallosome. For the same reasons the new species cannot be included in *A. corethroides* Theobald (see Edwards' description of the genitalia of Theobald's type in *Bull. ent. Res.*, xii, 352). The single spine at the base of the coxite is in strong contrast to the pair of parbasal spines found on each coxite of *A. aitkenii*.

In larval characters *A. powelli* is somewhat intermediate between *A. stigmaticus* and *A. aitkenii*, but the following tabulation will clarify the distinctions.

Comparison of Larval Characters.

Character.	<i>A. powelli</i> , n.sp.	<i>A. stigmaticus</i> Sk.	<i>A. aitkenii</i> James.
Inner anterior clypeals.	Bifid.	Simple.	Simple to plumose in different forms and varieties.
Outer anterior clypeals.	Simple, thickened, half the length of the inners.	Simple, thickened, at least half the length of the inners.	Branched, about half the length of the inners (<i>A. aitkenii</i>) or very short and simple (<i>A. palmatus</i> and <i>A. insulæflorum</i>).
Inner shoulder hair.	Shaft broadened.	Shaft not broadened.	Shaft broadened.
Pro-pleural hairs.	One long hair plumose.	One long hair may be plumose, but usually all three are simple.	One long hair branched apically.
Meso-pleural hairs.	Both long hairs simple.	Both long hairs simple.	Both long hairs simple (in var. <i>bengalensis</i> one is bifid).
Meta-pleural hairs.	One long hair plumose.	At most one long hair bifid or trifid.	At most one long hair is apically branched.
Fan leaves.	Appearing torn apically.	Smooth.	With normal serrations.
Pecten.	About 14 spines.	About 20 spines.	About 11 spines.